case of too prolific or redundant granulations in deep burns over large areas, apply a little of a 20 per cent solution of argyrol when renewing dressings, once a day or every other day as may seem necessary, and with this dressing you will rarely need to resort to skin grafting, even on extensive raw open surfaces.

MORTALITY RATES OF CARCINOMA OF THE UTERUS IN CALIFORNIA

By ALFRED BAKER SPALDING, M. D., *San Francisco*

In California, with an annual total number of deaths of from 52,000 to 54,000, it has been found that the total cancer mortality averages about 8½ per cent, which means an annual cancer death rate in the neighborhood of 4500.

It does not seem probable that cancer starts from a single cell, but rather that simultaneously many cells in a particular upset environment develop about the same time malignant characteristics.

DISCUSSION *by Frank W. Lynch, San Francisco.*

OUR ideas on the incidence and the mortality rates for cancer are based at present upon statistics gathered by various boards of health, by some hospitals, and by life insurance companies. The gathering of these statistics is an exceedingly complicated matter and calls for much expert understanding. Not until recently have any satisfactory figures been published. These corrected statistics have come chiefly from the larger insurance companies. At first glance it appears that malignancy is becoming alarmingly more frequent and some conscientious statisticians believe that cancer is increasing at the rate of 2 per cent a year. This impression is due in part to the fact that the older statistics report that only about forty individuals per hundred thousand died annually from the disease, while now many cities report over 100 annual cancer deaths per 100,000 population. In the United States the registration area for vital statistics is quite extensive and is most conscientiously supervised. Still, it suffers from unavoidable errors incident to the various factors which cause a physician to render, at times, an incorrect certificate as to the cause of death. Even with our own limited experience, we know of patients who have died of carcinoma of the uterus whose certificates of death state, with truth, that they died of heart disease or of an accident.

In California, with an annual total number of deaths of from 52,000 to 54,000, it has been found that the total cancer mortality averages about 8½ per cent, which means an annual cancer death rate in the neighborhood of 4500. Of these cancer deaths, the genital organs furnish 14½ per cent.

San Francisco presents an unique situation, in that it ranks highest in cancer deaths by a very wide margin, rating 132 annual cancer deaths per 100,000 population, while the combined average of nine other cities of the United States is only 104 per 100,000. Los Angeles ranks seventh, with a rate of 102 per 100,000 population. Due to this fact, San Francisco has been selected as a city that would prove interesting for cancer research and through the Hoffman Survey, the San Francisco Board of Health is now getting ready to carry out this work along very elaborate and comprehensive lines.

Doctor Frederick L. Hoffman has requested that the local medical profession assist him in a San Francisco cancer survey, by replying to a questionnaire regarding every cancer patient under treatment during the year 1924. These questionnaires are somewhat extensive, and will require considerable careful work on the part of the attending physician, but the result to be obtained is so important that we all should be more than willing to assist in this work.

To me, it does not seem probable that cancer starts from a single cell but rather that simultaneously many cells in a particularly upset environment develop about the same malignant characteristics. Just how long it takes for these few malignant cells to develop a noticeable cancer tumor that is histologically characteristic and produces symptoms noticed by the patient is unfortunately an unknown factor. Possibly what we speak of at the present time as a pre-cancerous stage is this early stage of cancer development. The duration of the disease from the onset of noticeable symptoms, such as hemorrhage, to the death of the patient is better known. While the course of the disease may, in one case, be very slow and in other cases very rapid, the usual time noted is somewhere in the neighborhood of two years. That has been our experience at Stanford, with a few cases observed where no treatment for the cancer had been carried out.

The patient is certainly fortunate who has a microscopical diagnosis of early carcinoma of the uterus, but the patient who comes for treatment a year after symptoms develop or who has been subjected to improper and incomplete surgery, with all the visible evidence of ulcer formation, or, still worse, cancer recurrence, is, in our experience, in a practically hopeless condition, so far as cure is concerned. So far-reaching is this that it seems justifiable and ethical to inform women over 30 years of age of the importance for routine pelvic examination at reasonable intervals, even though no symptoms exist.

Pinch very justly deprecates the statement at times appearing in the lay press that radium and other forms of radiation therapy are a failure and suggests that the term "cure" for advanced cancer cases be changed to "arrest of disease." Radiation therapy is an invaluable addition to our armamentarium for the care of the cancer patient. It is undoubtedly curative when used early enough, and frequently patients with advanced cancer have lived in comparative comfort after such treatment when all other resources of medicine and surgery had been exhausted. However, the only cures I have to report have been obtained with patients operated upon early by radical complete hysterectomy, in some cases aided by radium or x-ray either before or after operation. In the early stage of the disease, with this form of treatment I have 31.2 per cent of cures without recurrence in from three to seven years, with a series of thirty-two patients. The immediate operation death following hysterectomy was six, or a mortality of 19 per cent. This is somewhat higher than that usually reported, and is due in part to the inexperience of early clinic years. The last immediate mortality following hysterectomy was on March 1, 1918. During the past six years we have

had at Lane Hospital no immediate fatalities which can probably be accounted for by better staff organization and improved technique. With no other form of treatment have we succeeded in curing a patient for three or more years that ultimately did not die or have a recurrence, although we have two of forty-two radium-treated patients alive and free from recurrence since 1921, as against two of seven patients treated by operation alive and free from recurrence for the same length of time.

My present preference in choosing a method for treating the early case of carcinoma of the uterus is to treat the patient with radium and x-ray before operation; in about five weeks to do a radical hysterectomy with removal of parametrium and to avoid post-operative radiation, except for the treatment of recurrence. All suspected cancer patients are subjected to a diagnostic curetage and excision of cervix specimen, inserting 100 mg. of radium while awaiting a frozen section diagnosis. If found malignant, the radium is left in the uterus from twenty to thirty hours. The radiation department advise in each case as to the need of deep x-ray therapy. When deep x-ray therapy is used, we usually divide the treatment into two stages, with one-day interval. In an average case, the factors are approximately as follows: With a target skin distance of 50 cm., 300 to 450 milliamperes minutes

CANCER OF UTERUS

CHART I

Treatment	Body 16							Cervix 95							Body and Cervix 7						
		August, 1912, to April, 1921													April, 1921, to April, 1924						
	No.	Av. Age	Stage 1	Stage 2	Stage 3	Auxiliary Rad.	Auxiliary X-ray	No.	Av. Age	Stage 1	Stage 2	Stage 3	Auxiliary Rad.	Auxiliary X-ray	No.	Av. Age	Stage 1	Stage 2	Stage 3	Auxiliary Rad.	Auxiliary X-ray
Abd. Hysterectomy	32	47	20	8	4	11	2	7	48	1	4	2	7	6							
Radiation	16	45	3	6	7	16	1	42	48	3	9	30	40	29							
Pac. Cautery	8	48	0	3	5	1	0	0	0	0	0	0	0	0							
Percy Cautery	3	44	0	0	3	1	0	1	48	0	0	1	1	0							
Vag. Hysterectomy	1	39	0	1	0	0	0	0	0	0	0	0	0	0							
Untreated	6	51	1	0	5	0	0	1	41	0	0	1	0	0							
Total	66	45	24	18	24	29	3	51	46	4	13	34	48	35							
	34% operable; 50% had Hysterectomy							8% operable; 15% had Hysterectomy													
Series Total	117	45	28	31	58	77	38	117	45	28	31	58	77	38							
	24% operable; 34% had Hysterectomy																				

CANCER OF UTERUS

CHART II

Treatment	August, 1912, to April, 1921					April, 1921, to April, 1924				
	No.	Operative Mortal.	Total Dead	Aver. Cancer Life Months	Living with Recur.	No.	Operative Mortal.	Total Dead	Aver. Cancer Life Months	Living with Recur.
Abd. Hysterectomy	32	6	18	41	1	7	0	2	15	1
Radiation	16	0	10	20	2	42	1	15	21	11
Pac. Cautery	8	0	6	19	0	0	0	0	?	0
Percy Cautery	3	0	2	12	1	1	0	1	24	0
Vag. Hysterectomy	1	0	1	20	0	0	0	0	?	0
Untreated	6	0	5	31	1	1	0	1	17	0
Total	66	6	42	24	5	51	1	19	19	12

Of 66 cases in the first group: Immediate mortality from Hysterectomy, 19 per cent. One patient died 6 years and 2 months after Hysterectomy. One patient is living with recurrence 4 years and 8 months.

CANCER OF UTERUS

CHART III

Treatment	Apparent Cure at Last Visit August, 1912, to April, 1921									April, 1921, to April, 1924				
	No.	No. Cured	Number of years after operation 1 yr.	2 yr. X	3 yr. X	4 yr. X	5 yr. X	6 yr. X	7 yr. X	No.	No. Cured	No. yrs. after oper. 1 yr.	2 yr. X	3 yr. X
Abd. Hysterectomy	32	13	3	0	2	3	1	1	3	7	4	2	2	0
Radiation	16	4	4	0	0	0	0	0	0	42	16	14	2	0
Pac. Cautery	8	2	2	0	0	0	0	0	0	0	0	0	0	0
Percy Cautery	3	0	0	0	0	0	0	0	0	1	0	0	0	0
Vag. Hysterectomy	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Untreated	6	0	0	0	0	0	0	0	0	1	0	0	0	0
Total	66	19	9	0	2	3	1	1	3	51	20	16	4	0

Thirty-two Hysterectomies gave 3 to 7 years cures in 31.2 per cent. Thirteen Hysterectomies had radium as auxiliary. Six were carcinoma of cervix. One was carcinoma of body.

are given through a round port 25 cm. in diameter centered over the front of the pelvis, a ¾ mm. copper filter and 200,000 volts being used. On the following day a similar port is radiated over the back.

The accompanying charts state graphically my private and clinical experience with the 117 cases of cancer of the uterus treated from August, 1912, to April, 1924. With the patients treated before 1921, 71 per cent either died or had recurrence. Fifteen per cent were without recurrence from three to seven years, while 14 per cent were without recurrence so long as traced, being lost track of, however, before the three-year period was reached. Fifty per cent were operated upon, of whom 31.2 per cent were cured and 19 per cent died as a result of operation. Since 1921, radium and deep x-ray has been used more extensively, and only 15 per cent of the patients have been operated upon. The time is too short to judge fairly the comparative value of radiation versus operation, and the problem is more complicated because since using radium and deep x-ray therapy, although more patients are being received for treatment, a much larger percentage of the patients show advanced cancer growth. Of twenty-five patients dead after radiation treatment, the life duration was less than with twenty patients dead after operation. However, of the twenty-five patients dead after radiation, one died of an accident, one of a heart lesion, five had had incomplete operations by outside doctors before radiation treatment, and two died following hysterectomy by their family physicians after radium.

The prognosis for early cancer of the uterus is so good and a fatal outcome for advanced carcinoma of the uterus, regardless of treatment, is so sure that the greatest hope for reducing the apparently increasing cancer death rate seems to lie in more frequent routine examinations by the family physician, the prevention and eradication where possible of all local and general irritations, the earliest possible pathological diagnosis in suspicious cases and in proven cases, the pre-operative use of radium and deep x-ray followed in a few weeks by complete radical removal of the uterus and parametrium.

Stanford University Hospital.

DISCUSSION

FRANK W. LYNCH, M. D. (University of California Hospital, San Francisco)—I believe that a statement of some of my findings would be of interest in connection with Doctor Spalding's paper, because, first, my observations agree absolutely with his and secondly, because the tables from our respective clinics undoubtedly represent a very considerable proportion of the uterine cancers in San Francisco during the period covered.

Since July, 1915, I have treated 218 patients for carcinoma of the uterus, but, for present purposes, will exclude all the cases that were neither radiated nor operated. We will begin our series in March, 1916, when I did the first radical operation in the present group. Between that time and October, 1923, I have treated 168 uterine cancers by operation or radium or in combination. The series should be closed January, 1920, to permit a study of cures, since I cannot discuss any case that has stood less than five years from the standpoint of cure. Our series, however, is so small that it probably will never be large enough to permit the discussion of the broad question of cures.

The chief trouble with small series is that a few unusual cases give false values. Ours may well suffer from such a reason. Yet few may ever hope to present a series as large and well controlled as Wertheim's unsurpassed group of 1500. Our material presents 168 cases divided as follows:

TABLE I

148 carcinoma uterine cervix, 114 no previous operation for cancer, 34 operated for cancer by others, sent in for post-operative radiation.
20 carcinoma uterine fundus.

CARCINOMA OF UTERINE CERVIX

TABLE II

Primarily operable, 30 (26 per cent of 114).
Refused operation, 2.
Operation contra-indicated, 5.
Operated by radical method, the majority with pre-operative or post-operative radiation, 23.
(Four deaths—17 1/3 per cent.)
Radiated only, 7.

TABLE III

Operated between March, 1916, and Dec. 31, 1920, 19.
Died from operation, 4.
Died from cancer, 4, at 9 months, 1 year, 1 year, 3½ years.
Died from intercurrent disease, apparently free from cancer (no autopsy), 2. One stroke at year, 1 pneumonia at 5 years.
Lost, 4, but well at 2, 2½, 3 and 3 years after operation.
Living and well, 5, at 3, 4, 5, 5½ and 7 years after operation.

Four cases of the nineteen were known to have been clinically well at least five years (21 per cent). Nine of the nineteen were well for a minimum of three years: one dying later from cancer; one at five years from pneumonia; two have been lost; and two are still short of a five-year period of observation.

TABLE IV

Operable cases radiated only, 7.
Deaths from treatment, 0.
Died from heart attack, symptom free from cancer, 1, at one year.
Died from cancer, 3, at 3, 3, and 3½ years after treatment.
Clinically well, 3, at 3, 4¾ and 5 years after treatment.

TABLE V

Inoperable cervical carcinoma, made operable by radium, 4 living at 1 year with recurrence; 22 months, with recurrence; 2 years and 5½ years.

The first two were operated when the growth appeared to be recurring, since it did not again respond to radium. The last two were operated while the growth appeared to have been controlled by radium.

TABLE VI

Inoperable cervical carcinoma radiated only, 80.
Lost, 2.
Dead, 64; 44 in first year, 9 in second year, 4 in third year, 7 in fourth year.
Living, 14; 7 less than 2 years, 3 in third year; 3 in fourth year; 1 in fifth year.

TABLE VII

Cancer of cervix operated elsewhere, radiated by me, 34.
Living, 5, at 1 year, 2½ years, 3 years, 3½ years, 5 years.
Dead, 29, 4 only lived more than 2 and less than 3½ years.

CARCINOMA OF UTERINE FUNDUS

TABLE VIII

Carcinoma of uterine fundus, 20.
Operated radically, 9.
Operative death, 1.
Dead from disease, 1, in 6 years.
Lost track of 2, both well at 1 year.
Living with recurrence, 2, at 1 and 2 years.
Living and well, 2, at 3 and 7 years.